Abstract of relevant passages of Erich Hau „Windkraftanlagen"; Springer–Verlag Berlin Heidelberg 1996, 2. Auflage

The textbook of Erich Hau deals with wind turbines. The relevant passages which were used in the opposition proceedings against the European patent EP 1 497 556 B1 as well as the German patent DE 103 00 733 B3 are summarized as follows.

In chapter 5.3.1 on page 81 the power control with pitch angle control is mentioned. It is mentioned that the pitch angle can be rotated actively and passively. Furthermore, it is said that the power is influenced via two principle ways to change the aerodynamic pitch angel of the rotor. The first way is to change the pitch angel to smaller aerodynamic angel to reduce the power consumption. This method leads to a fine and stable control of the aerodynamic power consumption and the speed of rotation. The other possibility is to use the state of stall, in which the airflow at the rotor blades is breaking away.

On page 313, chapter 10.1, a wind measuring system is shown. For the control of the wind turbine the measurement of wind velocity and wind direction is necessary. This is at least valid for larger wind turbines. However, the automatic control of power and speed of rotation is also for larger wind turbines performed without a direct measurement of the wind velocity. This is due to larger problems in measuring the wind velocity for use as direct input value for the automatic control. A single value is never representative for the power production of large wind rotor which covers an area of more than 1,000 m^2. Thus, it is better to measure the wind velocity indirectly via the electrical power output.

On page 394 a diagram 13.01. is shown which shows a coefficient of the rotor (C_p) over the tip speed ratio λ for several pitch angles δ. It is shown a

curve for full–load (Volllast) and part–load (Teillast). There is also shown the nominal operating point (Nennbetriebspunkt).

On page 397, chapter 13.1.3 the power characteristic curve is topic. It is said, that if the power coefficient of the wind rotor is known, the power delivery can be calculated by the formula $P_{el} = c_{pA} \frac{\rho}{2} V_W^3 F_{Rotor}$, wherein ρ is the air density, V_W is the wind velocity and F_{Rotor} is the area which the rotor covers with the rotor blades.